

METHOD FOR IDENTIFYING A PERSON DRIVING A VEHICLE AND CONTROLLING  
DRIVING MANNER

The invention relates to a method for identifying a person driving a vehicle and for observing his/hers driving style and also to switch on the vehicle either to driving-allowing mode or to drive-stop mode, whereby the vehicle comprises a code, a card or a similar object containing data, or for instance, a scanner of driver's finger or another part of his/hers body and a control unit, and the driver is provided with a personal code or a card containing said data or with a corresponding identification means, as the finger for instance.

Previously known as a drive-stop device is, among other things, the driver-testing alcometer, into which the driver must blow on starting driving. Such an arrangement is not fully reliable, since it is possible that blowing is done by somebody else. This arrangement does not pay regard to other driving disturbing and driving endangering characteristics of the person, as stupor, fatigue, agitation or that the person wants to drive without driving license.

By means of the method as per the invention it is possible to observe and to notice surprisingly during driving the deviations of driver from his/hers normal driving style stored on driver's card or object, and thus it is possible by means of equipment in the vehicle either allow or to stop driving. The method to identify a person driving a vehicle as per the invention is characterized in that in the method information of the driving style of the driver is stored on said card or object or to a data-collecting unit in the vehicle and on start the driver inserts said card or object into the scanner in the vehicle, whereby data, received from selected devices of the vehicle and/or from different information-collecting detectors, is compared with the driving type information stored on driver's card, and on basis of the comparison the control unit in the vehicle either allows driving or gives information of drive-stop or similar other consequences.

The method to observe a person driving a vehicle as per the invention is characterized in that in the method information of the driving style of the driver is stored in said card or object or to a data-collecting unit in the vehicle, and on start, the driver inserts said card or object into the scanner in the vehicle, or gives other identification, as a code, finger identification or similar to said scanner in the vehicle, whereby data, received from selected devices of the vehicle and/or from different information-collecting detectors, is collected on the driver's card or on the

information-collecting unit in the vehicle.

The intention with the invention is to create an observing and stopping system in connection with driving a vehicle, according to which system driving is possible only by a personal card or a corresponding object or similar to be placed in the vehicle, and drive-stop possible also during driving, if there is something in the driver's driving style deviating from the normal. The system also excludes replacement of driver by another person, who does not have a card giving right to driving. By means of the invention also the driver's driving type and especially the treatment of the vehicle can be controlled as well as passengers' feelings due to driving style or forces and motions directed on the load in a lorry.

In the following the invention is disclosed with reference to the enclosed drawing, where in figure 1 a system according to the invention is shown diagrammatically.

According to the invention into the vehicle a card-reading device 1 is placed, which most suitably includes at the same time a control centre for the system. Everyone, who intends to drive the vehicle, must have a personal card 2, on which driving type information of the person in question is stored. For instance, said information can also be stored in an object like a key. Control centre 1 has a display 3, from which the driver can get instructions and also information how the system will switch on drive-stop. As driving type information data is transmitted from detectors to control centre 1 by means of cables, which are, for instance, in connection with steering wheel 4, from which information is received regarding steering wheel handling, from accelerator pedal 5 regarding the use of gas, acceleration values from different directions, sideways acceleration 6, forward acceleration 7 and deceleration 8 and detector 9 can, for instance, also be in the seat giving information of sitting behaviour. By means of acceleration detectors information is also received of an accident, as a collision resulting in stopping.

In vehicle controls and other suitable places that can come into question detectors or corresponding scanners are placed to send to the control centre information of the function of said devices. The control centre is arranged to compare continuously information from detectors with driving type information read from the driver's card. Experimentally, limits can be determined when the driving type difference exceeds such a limit that the driver can be reckoned to deviate from his/hers normal driving type. When a limit of this kind is exceeded, then the system starts to

inform of coming drive-stop and that one has to get ready for it. The system switches on the drive-stop if the driving type does not turn to normal. For instance, in this case it can be the question of fatigue, which the system observed, and hereby the system forces the driver to rest.

The system includes a time of precaution that the system maintains for the same driver, if he/she tries to start driving too soon, when the vehicle has been stopped by drive-stop. Due to fatigue the precaution time can last from  $\frac{1}{2}$  to 2 hours. Due to identified drunkenness, the time of precaution ought to be longer. Most probably it is possible by means of the system to separate fatigue from drunkenness and to regulate the time of precaution accordingly.

Of course, the driver's state of being drugged or drunken gives alarm almost at once on starting to drive, since then the driver is not capable to manage driving as stored in the personal card.

If the road conditions cause change of the driving style, there is in the vehicle identification of road conditions, as detection of road conditions due to skidding of wheels. In addition, measuring of outside temperature gives additional information of road conditions. Then the control centre pays regard to the change of driving type into more cautious direction and accepts the driving style changed in this way.

Because, over the years, there is gradual changing of driving style of the person, the system can be modified in the long run, to change, the driving style information of the person into better observation of both driving style and gradual changes in it. The system is thus applicable to store on the card of the person in question information changing in the long run, and thus the card information is kept updated.

When vehicles are furnished with this system, anybody possessing a personal card can go for a drive with any kind of vehicle by inserting the card into the card-reader. Of course, the vehicle must be legally handed over, as keys to the door and to the ignition lock. It is easy to add to the system a function that only certain personal cards are restricted by which the vehicle can be usually driven. The data of these cards is stored in the control centre.

There are situations, where the driving type is not normal and the system as per the invention starts to inform eventual drive-stop. It can then be, for instance, the question of emergency far

away from built-up area, the driver drives contrary to his/hers normal driving style and it is a must to carry out transport. Then switch-on of drive-stop could be dangerous. For such a case, the system can, for instance, include a function that driving is possible with warning blinkers on and alarm signal in proper use. However, it is also a disadvantage, for instance, that a police escaping person is able to drive in this way as well as a drunk.

In one embodiment it is possible for the driver to pass the drive-stop in taking wireless connection to an authority and asking the authority to make the passing of drive-stop, for instance by means of a wireless signal, or that the authority gives the driver the key code over phone, the input of which into the control unit deletes the drive-stop. This is applicable in a situation of emergency, whereat the authority also knows who the driver is and his/hers whereabouts. Location of vehicle takes place also at the same time on basis of location by means of known telephone connection or that the unit centre sends the authorities location co-ordinates (GPS) during the telephone connection.

It is possible to arrange wireless connection from vehicles. For instance to the Vehicle Administrative Centre, whereat the police, for instance, becomes information of who is driving the vehicle. It is the possible to arrange for the police a possibility to stop the vehicle travel without chase, sending a signal of drive-stop to the vehicle. One possibility is also that always before starting driving the validity of the driving licence is checked from the Administrative Centre of Vehicles.

To the control centre in the vehicle a function can be arranged to give alarm without driver's functions to a place agreed beforehand, for instance in case the driver gets into an accident, collision with an elk or similar (acceleration detectors indicate). Thus, for instance, information of accidents at night time will be transmitted swiftly and help will get to the scene fast enough.

A control unit as per the invention is furnished with a location system utilizing, for instance, mobile phone techniques. Information of a possible accident will be received quickly.

The validity of driving licence according to the invention can also be restricted by remote control with a signal from the authorities.

In another embodiment the system can be applied to observation of driver's driving style and especially to observe how he/she treats the vehicle. By means of detectors arranged in the vehicle data of driver's functions are received. Detectors are arranged in necessary devices, such as clutch, accelerator pedal, steering wheel and, furthermore, in acceleration detectors to measure accelerations in three directions, for instance. By means of the method it is possible to observe how a buss driver works and thus his/hers suitability for the occupation. Afterwards the driving functions are registered for control. Single, abnormal functions can be eliminated and long period functions observed in general, whereat the actual driving culture of the driver can be examined.

By means of detectors placed in the cabin the passenger feelings in the car are found out just as forces directed on the load in a lorry by means of detectors arranged in the cargo space. In the apparatus an action light can be mounted for the driver informing him/her of excessive swerve or acceleration. In this way the driving style of the driver could be influenced. Also the consumption value of fuel, momentary or periodic average, can be transmitted regarding each driver to their card or to the data-collecting unit in vehicle.

The driver of the vehicle can be identified in the vehicle also by means of the code or the object, whereat regarded as object is for instance driver's finger, eye or other part of his/hers body. Detectors that come into question are mounted in the control devices as occasion demands and acceleration detectors in different parts of the vehicle. Some detector data can be received from devices standard in the vehicle, such as anti-skid system.